LIQUID FUEL REFORMING AND BLENDING METHOD

BACKGROUND OF THE INVENTION

(a) Field of the Invention

The present invention relates to a liquid fuel reforming and blending method, and more particularly to the reforming and blending method which converts waste heavy oils into a fuel applicable for usage in various combustion systems, and which thereby increases economical value of waste heavy oils and reduces environmental pollution.

(b) Description of the Prior Art

Because of low price and safe storage of heavy oils, majority of industrial fuel systems are fueled by the heavy oils. However, boiling points of the heavy oils are too high, with A-class heavy oils having a boiling point of 338°C, while B-class and C-class heavy oils have boiling points as high as 480°C, and thus such heavy oils are difficult to vaporize. Therefore, though several types of heavy oil combustion furnaces are adapted to employ various methods to enhance atomization or vaporization of the heavy oils, including high-pressure spraying, rotary-type methods, and so on, because the heavy oils are not easily vaporized, and, moreover, because the heavy oils are of high

viscosity, incomplete vaporization and large atomized particles result. Hence, inability to achieve complete combustion not only results in loss of a large amount of calorific value, but also dense smoke is produced as a consequence of the incomplete combustion, which causes pollution of the atmosphere.

However, recent years have seen a rise in an awareness of environmental protection, and emphasis is placed on recycling of all usable resources. Hence, there are people who have commenced research in methods for resource recycling of various products.

In light of the aforementioned, the inventor of the present invention has committed time and energy to research into dissolving of conventional waste heavy oils in alkanes, the waste heavy oils including C-class heavy oils such as waste engine oil, waste edible oils, waste grease or boiler fuel, and so on, and after many successive experiments, finally accomplished a reforming and blending method for converting the heavy oils into a new type heavy oil. The new-type heavy oil produced by the reforming and blending method has properties including reduced viscosity, which promotes atomization and vaporization, and thus realizes effectiveness of complete vaporization of the new-type heavy oil, which thereby facilitates complete combustion, ease of volatility,

high calorific value and low pollution, and moreover, actualizes an achievement which makes use of the waste oils and lowers fuel cost to benefit of industry.

SUMMARY OF THE INVENTION

A primary objective of the present invention is to resolve and eliminate the aforementioned shortcomings, whereby, because of property of alkanes to increase atomization, the present invention employs the alkanes as a combustion-supporting agent, and after heavy oils are dissolved in the alkanes, a blending method is utilized to form a fuel applicable for usage in various combustion systems, and which thereby achieves objectives of increasing economical value of the heavy oils and reducing environmental pollution.

To enable a further understanding of the said objectives and the technological methods of the invention herein, the brief description of the drawings below is followed by the detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a flow chart of an oil refinery for production and blending of gasoline according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A liquid fuel reforming and blending method of the present invention primarily employs alkanes as a dissolvent, whereby after heavy oils are dissolved in the alkanes, the blending method is utilized to form a fuel applicable for usage in various combustion systems. Wherein blending proportions of the alkanes and the heavy oils in the fuel are as follows:

Alkanes 90%~10%;

Heavy oils 10%~90%;

which therewith achieves a flash point temperature of at least 45°C, and thus the heavy oils are converted into a fuel for usage as a furnace fuel, and thereby enhances economic value of the heavy oils.

Furthermore, C-class waste heavy oil products including waste engine oil, waste grease, waste edible oils or boiler fuel, and so on, can be utilized as a heavy oil raw material source for reforming in the liquid fuel reforming and blending method of the present invention, wherein a preferred formulation for reforming includes: a 50%~50% proportion of the alkanes and the heavy oils, and wherewith achieves a preferred flash point temperature of 55°C~75°C for the liquid fuel.

While, prior to utilizing the blending method on the heavy oils, reforming oil from bottom of a gasoline tower or reforming oil from bottom of an aromatics extractive tower should achieve following

specifications:

Polyaromatic alkanes (containing at least 40% aromatic alkanes);

Flash point of above 45°C;

Initial boiling point of above 160°C;

Final boiling point ranging from 360°C to 480°C;

Specific gravity ranging from 0.75 to 0.99.

Moreover, the alkanes employed are isomers of the polyaromatic alkanes having between 9 and 20 carbon atoms.

In addition, technical parameters as disclosed in the present invention provide a basis for a preferred embodiment, wherein a 3~5 percentage allowance is acceptable.

In conclusion, after the heavy oils are dissolved in the alkanes (polyaromatic alkanes, C9~C20), the blending method is utilized to form the fuel applicable for usage in diesel oil combustion systems and slow-speed diesel engine systems. Furthermore, the alkanes and the heavy oils are blended in proportions ranging from 10% to 90%, which thereby achieves the flash point temperature of above 45°C.

Advantages of the present invention:

The present invention utilizes reforming of the oil from the bottom of the gasoline tower or reforming of the oil from the bottom of the

aromatics extractive tower to convert the aforementioned otherwise discarded heavy oils into usable furnace fuel, and thus the present invention takes full advantage of inherent value of the heavy oils to achieve practical benefits as disclosed hereinafter:

1. Energy aspect: enhances economic benefit, whereby the inexpensive, little-used oil from the bottom of the gasoline tower or the oil from the bottom of the aromatics extractive tower (which can only be used to feed a cracking process) undergoes reforming and thereby is converted into usable fuel, and thus generates further revenue from the waste oils.

2. Environmental protection aspect: the furnace fuel obtained after the reforming and blending method of the present invention is completely combustible, and thereby reduces pollution produced as a result of incomplete combustion, such as black fumes, and hydrocarbon compounds, and thus achieves zero pollution of environment.

3. Cost aspect: because the oil from the bottom of the gasoline tower or the oil retrieved from the bottom of the aromatics tower is unsuitable for usage as gasoline or kerosene, and also cannot be used as aviation fuel or diesel fuel, and which can only be utilized to feed a cracking tower, therefore cost is lower than cost of C-class heavy oils.

It is of course to be understood that the embodiments described herein is merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the spirit and scope of the invention as set forth in the following claims.